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## SERIE RESEARCH MEMORANDA

### Venture capital as a critical success condition for hightech development

Experiences from the Netherlands and Israel

Peter Nijkamp  
Cher Culdemon  
Hugo Teelen

Research Memorandum 2002-10

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# **VENTURE CAPITAL AS A CRITICAL SUCCESS CONDITION FOR HIGH-TECH DEVELOPMENT**

## **Experiences from The Netherlands and Israel**

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### **Abstract**

This paper discusses the role of venture capital 'as a catalyst in policy efforts to stimulate high-tech activities. After a concise review of recent developments in venture capital provision in our ICT age, two interesting recent national experiences, viz. from The Netherlands and Israel, are discussed. Various critical success factors of corporate venture capital provision are identified and critically reviewed. The paper concludes with some brief policy lessons in terms of private initiatives and a broader sectoral orientation.

## 1. Entrepreneurship in Economie Tides

Innovation is the driving force of the dynamics of cities and regions. It is at the heart of entrepreneurship and the medium through which business firms are able to gain a competitive edge. Thus, innovation is not an autonomous miracle, but is emerging out of dedicated efforts of risk-taking firms seeking to survive and to grow. Geographic seedbed and incubator conditions, knowledge production and adoption, creativeness and communication potential, business lifestyle and culture, as well as access to and use of venture capital are critical success factors for Schumpeterian entrepreneurship generating economic progress (see also Bögenhold et al. 2001; Bertuglia et al. 1997; Davelaar 1992; Hofstede 1991; Romein and Albu 2002). Modern economic growth theory (including the new economic geography, the endogenous growth theory and modern innovation theory) has rightly emphasised the crucial role of the innovative entrepreneur (see e.g. Acs 2002; Keizer et al. 1997; Nijkamp 2002; Sexton and Smilor 1986). And it is increasingly recognised that entrepreneurship is not just a single act, but is based on a risk-taking business culture in a competitive regional or urban environment.

In the history of economic thinking the entrepreneur has played a central role. Unfortunately, the interest in entrepreneurial culture and behaviour has largely vanished in economic research in the last part of the twentieth century. Other disciplines (e.g., organisational sociology, business psychology and management science) took over this important role. But in recent years we witness again an upsurge of scientific economic interest in the 'entrepreneurial hero' as a **real** risk-taker (see e.g. Cabellero and Jaffe 1993; Mankiw et al. 1992; McCann 2001; Neary 2001). The entrepreneur is back on the stage. Especially in the ICT sector we have seen an avalanche of new entrepreneurial initiatives (see Braczyck et al. 1997; Caimcross 1997; Clerides et al. 1998, Cooke and Wills 1999; Coyle 1998; Jaffe et al 1993; Kotkin 2000; Ohmae 2000).

Despite the abundance of literature on regional innovation, regional dynamics and firm growth, it ought to be recognised that *entrepreneurial risk strategy* in a regional context is a hitherto under-researched topic. Clearly, due attention has been given to participation in and access to geographic (formal and informal) networks as vehicles to create increasing returns in an uncertain local and global business environment (see e.g. Malecki 1997; and Schiller 1999), but the importance of regional (or urban) capital provision (in particular, venture capital) has been largely neglected. Permanent

and rapid technological advances are a *sine qua non* for a forefront position of industries and firms in a region. Innovation-oriented and knowledge-based firms are able to translate new concepts and findings into commercially viable products and services, and hence create employment and wealth in the region.

New initiatives and novel business strategies however, are not '*manna from heaven*', but need the fulfilment of a variety of success factors as mentioned above. Due financial support for new business plans is a necessary condition, but exposes the founders of such activities and the financing institutions to considerable risk. Among both policy-making agencies and private business organisations there is a clear awareness that uncertainty management is particularly relevant for the supply and use of financing institutions and systems in terms of (formal and informal) risk capital, corporate venturing, banks and institutional investors, (semi-) public financing schemes and private-public entrepreneurs. The great diversity of financing possibilities has however, several factors in common, in particular the need for clear market perspectives, a considerable degree of flexibility for investors to exit ('bail-out') in order to reduce the risk in finding a buyer for the participation, a balanced risk portfolio of the business activities concerned (including also framework conditions such as financial assets), and the regional institutional support conditions (such as trust and reliability, open business culture and regional image). It is noteworthy that venture capital companies operate increasingly on international markets and are hence able to compose a solid risk portfolio across many countries. The acquisition of seed and start-up capital for new start-up firms in the high-tech sector is often rather problematic, as normal venture capitalists tend to be in favour of relatively safe investment activities with quicker returns (e.g., in later stages of a risky project). This may be detrimental to the financing possibilities of new technology-based firms and may also hamper technogenesis, innovation promotion and useful exploitation of innovation activities at the regional level.

Thus, the creation and the use of seed and start-up capital sources for high-tech firms deserve thorough attention. This paper aims to address the role of venture capital in the formation of new high-tech firms and in regional development. Section 2 will offer an overview of different venture capital schemes and of their usefulness in generating high-tech development. Next, two national experiences are put forward in two subsequent sections, viz. from The Netherlands and from Israel. Both policy schemes have largely the same objectives, but differ entirely in their form and

implementation. In both cases an **attempt** is made to identify and assess critical success factors for venture capital provision and usage. The final section of the paper summarises the arguments and offers some policy lessons.

## 2. Venture Capital Lovers

Dynamic sectors of the economy, such as the information and communication technology (ICT), have the **promise** to **generate** high returns, but also face a considerable risk to fail and vanish. The development of these sectors is a central concern for modern entrepreneurship and involves considerable risk-taking. The role of venture capital is well known in the economic history of Europe. Without venture capital institutions (often provided by public and semi-public institutions) Europe would never have taken the lead in international trade across the world. The financial support of Queen Isabella for Columbus **may** be seen as one of the earlier examples of venture capital provision. Nevertheless, it has lasted until the post-war period before venture capital started to play an important role, in particular in the United States. An interesting illustration of risk capital management can be found in the ‘research & development’ initiatives of Harvard professor George Doriot, who in 1946 created a capital fund to support starting scientific entrepreneurs in the Boston area. Later on (1958), the US government recognised the importance of risk capital provision and created the ‘Small Business Investment Companies’ (SBIC) Programme with the aim to facilitate the use of venture capital by start-up companies. In the beginning of the 1970s, the computer industry (including the semi-conductor and micro-electronics sectors) started to boom which generated an avalanche of new venture capitalists, in particular in the Silicon Valley and Route 128 areas. By the end of the 1980s the venture capital market in the USA was a **mature** sector (see Pfirrmann 1997 and Pratt 1981). In Europe we have witnessed only after the 1980s seen a high interest in the use of risk capital for new firm creation, in particular in the high tech sector. Ever since, the venture capital supply and use has gained increasing popularity.

The definition of venture capital is not always unambiguous, but for the sake of unambiguity and clarity we will adopt here the definition given by Pratt (1981).<sup>1</sup>

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<sup>1</sup> “*Venture financing is primarily regarded as the early-stage financing of relatively small, rapidly growing companies. Venture capitalists have taken on an expanded role in business development financing. Their investment activity covers a broad spectrum of investment interests encompassing virtually all phases of business development. Venture capitalists provide early-stage development funding and expansion financing for companies that have overcome initial hurdles and require*

Clearly, there are significant differences in private and public venture capital investments, in particular as far as the management and the commitment by the investor are concerned. Despite a great variety in venture capital provisions, the active involvement (e.g., monitoring of performance) of the financier is a common element in almost all risk capital models. Another common element is the relatively longer period of participation (usually between 3 and 6 years). And a final common feature is that the returns for the venture capitalist comprise mainly the capital gains realised through the sales of shares. It is conceivable that, given the high risks involved, a venture capitalist wants to rely on a due diligence process (based on a careful investigation regarding added value, professional management, market conditions and returns prior to its financial participation itself) (see also Barry et al. 1990, Sahlman 1990, and Silver 1985).

In the light of the foregoing concise review, it is no surprise that there is still much debate on the nature of venture capital, but for our purposes it suffices to take for granted that it refers to high return investment in (usually) small and high risk new enterprises that are founded with the purpose of commercial application of an hitherto unknown technological innovation (either a product or a process innovation). In practice, venture capital covers mainly investments in early-stage equity linked financing characterised by uncertain returns and low marketability, so that the (medium-term) investment returns stem in particular from capital gains (Von Burg and Kenney 2000).

It does not need much debate to see that in many cases venture capitalists act not so much as financiers, but rather as company builders by providing management advice and contact networks, and by monitoring the (financial) performance. There is clearly much heterogeneity among venture capitalists, such as private investors, professional venture capital funds and firms, investment banks, informal risk capitalists ('business angels') or existing business firms (see Murray 1998). The various risk capital agencies offer also various financial support mechanisms, such as seed financing, start-up financing, first-stage and higher-stage financing etc. The vast majority of venture capital investments in the USA is at present targeted at ICT firms,

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*additional capital for growth but do not yet have access to public or credit-oriented institutional funding. In addition, venture capitalists, together with entrepreneurs and business management, finance management/leveraged buy outs to purchase major corporate divisions or absentee-owned private businesses with the objective of revitalizing an existing business. "*

with a clear overrepresentation of internet-related companies. Europe is certainly lagging behind, although the European Venture Capital Association makes at present intensive efforts to facilitate and advocate the use of venture capital for start-up companies. An interesting exception is offered by Israel, which has in recent years demonstrated a record level of investment in high-tech (in particular ICT) firms, in which venture capital plays a critical role. Israel was even recently mentioned by Business Week (see [www.israelventure.com](http://www.israelventure.com)) as the *'land of milk and venture capital'*.

In recent years we have witnessed an increasing popularity of corporate venture capital. This phenomenon originated from the recognition that the search for innovative activities should not interfere with daily management activities. Consequently, many companies are trying to separate their new business undertakings from their current business structures. Corporate venture capital aims then to buy small stakes in start-up companies with a risky, yet promising business perspective. We will adopt here the following definition of corporate venture capital: *"A structure created within major industrial groups to invest in and to construct innovative new companies, which have, though of limited dimensions, great potential for future growth and, in any case, the potential to develop synergies with the core business of the group in a mutually beneficial partnership"* (Telecom Italia). This definition includes several features, such as the existence of an industrial parent organisation, involvement of a financial investment in ventures outside the organisational boundaries of the corporate firm, the expectation of strategic (not necessarily always financial) benefits or synergies, and absence of financial service subsidiaries or in-house banking. Sometimes these corporate venture capital organisations may comprise larger networks including universities and research centres.

The origin of corporate venture capital dates back to the late 1960s/early 1970s, when several companies established a corporate venture capital initiative, which did not lead to a booming development. It lasted until the 1980s before corporate venture funds were on a rising edge. But only recently (since 1995) we observe a surge in corporate venture capital initiatives (e.g., Intel, Microsoft, Lucent, Cisco), mainly driven by the goal to give an additional push to innovativeness. This model was soon followed by European companies (e.g., Shell, Philips, Bayer, Siemens, Akzo-Nobel, Nokia). This recent move was marked by various characteristics, in particular, a shift from financial to strategic interests, an orientation from business control towards



partnership, and a gradual acceptance of corporate risk capital funds by mainstream – instead of only excellent – corporations.

The corporate assets that can be deployed to the venture firm's advantage are *inter alia*: capital provision, the corporation name, the marketing and distribution network, the technical know-how, the management and organisational know-how, and the network of contacts with suppliers or clients.

It should be added that corporate venture capital systems may also embody various risks for the financing firm concerned, such as financial losses, loss of reputation in case of a failing initiative, and risk of demotivation among own R&D personnel who would like to create new things in-house (see Pfirrmann et al. 1997).

The degree of success of corporate venture capital initiatives has not always been overwhelmingly high, due to uncertainty on the competence of the corporation, unwanted and unforeseen interference of two cultures, ambiguous strategic goals, or role conflicts with the venture firm. A clear definition of goals (strategic, technological, industrial, entrepreneurial) is, therefore, a prerequisite. A successful corporate venture capital constellation requires at least four systematic steps, viz. (i) a clear development of the venture programme, (ii) a systematic inventory of investment opportunities and selection criteria, (iii) a balanced management of the investment portfolio, and (iv) assimilation of investments and venture expertise to core business.

A recent development in corporate venture capital initiatives has become *syndication* among various investors to spread the risk. Syndication is based on a network of partners who are willing to share risks, to share information with other investors, to build up a joint contact network and to spread investments. In this way, the level of business uncertainty can be reduced, in particular in case of large investments.

Finally, the geographical setting of innovative behaviour has to be addressed. There is nowadays a tendency towards a regional specialisation of high-tech firms. Well-known examples are Silicon Valley, Silicon Glen in Scotland, the Côte d'Azur, the Randstad in The Netherlands, and Shalom Valley in Israel. According to Shefer and Frenkel (1998) rapid technological adaptation and dissemination are the visible signs of regional development and innovation. Regions with a high innovation potential house usually a highly skilled labour force and a high educational infrastructure and are able to generate a competitive advantage. The regional business

culture is of utmost importance for a high regional economic performance, as opportunity-seeking behaviour and risk management are the core elements of successful entrepreneurship. In this context, also proper systems of (corporate) venture capital initiatives play a leading role.

Starting entrepreneurs tend to seek for venture capital and related support services (e.g., information, business knowledge and management expertise) in their own geographical environment. Thus, the significance of the local financial community for the performance of local entrepreneurship is an important policy issue (Eisinger 1993, Florida and Kenney 1988, Malecki 1997).

After this exposition on the role of venture capital in firms' innovation strategies, we will in the next two sections offer two types of experiences in venture capital policy, one in The Netherlands and one in Israel. In both cases we will address initiatives to stimulate ICT developments. This sector has exhibited a remarkable world-wide growth in the past years, but individual countries are eager to development strategies that would ensure a leading position of this sector in their country by offering favourable venture capital support for new market entrants, in particular in the SME sector. The policy and the experiences in both countries are entirely different, so that there is no scope for a straightforward comparison that might lead to common lessons. Nevertheless, in a more general sense some important policy conclusions can be drawn.

### **3. ICT Venture Capital Initiatives in The Netherlands**

In 1997 the Dutch government has launched an initiative aimed at supporting start-up firms and secondary growth companies in the ICT field. The background was formed by the idea that the competitiveness of the Dutch (and European) ICT industry was lagging behind that of other regions of our world. Barriers are inter alia formed by limited access to management and marketing skills and by insufficient access to adequate financing opportunities. To improve the current situation, a better environment has to be created in which ICT starters can thrive, in particular in the software and multimedia area. As a first step forward, a solution framework was foreseen that included both a coaching and a financing mechanism. Research has shown that in building the mind-set and the skill base for the information society a proper management advice in setting up a new company, adequate and tailor-made supervision in marketing products and services, and better access of both starters and

secondary growth firms to venture capital are a *sine qua non*. The Dutch policy to favour ICT start-ups is called *Twinning*. The Twinning programme is a government initiative and serves to reinforce the Dutch ICT position (as present the ICT sector accounts for approx. six per cent of GDP). The problem is that The Netherlands does not have a starters' culture in this area. By creating a start-up fund and a secondary growth fund accompanied by a support system for starters a new way forward has to be implemented (see for details Teelen 2001). The eligibility criteria for the Twinning programme are: (i) ICT orientation; (ii) innovative product or process; (iii) feasibility on a broader (international) market; (iv) start-up companies. The Twinning concept has the following main constituents:

- *Twinning network*. This is a network of individuals (business partners, network partners and advisors) who have a proven track record as entrepreneur or financier in the ICT field and who are willing to offer valuable (inter)national contacts to new business firms in order to receive practical and strategic information. Also financing agencies and potential investors may benefit from this network system.
- *Twinning centres*. These are regional agencies that aim to accommodate and coach ICT starters. The management team of these centres advises start-up companies and helps them to forge contacts by organising meetings with consultancy firms or business partners.
- *Twinning funds*. These are venture capital funds that provide commercially viable business plans with necessary financial and management support. There are two types of such funds. First, there is the Twinning Seed Fund, which provides convertible subordinated loans to, or acquire a participating interest in, ICT start-up firms. These loans or participating interests have normally a limited duration (3 to 5 years). Next, a Twinning Growth Fund is created which is targeted at ICT firms in a secondary growth stage. This fund will act as a co-investment fund, and includes also a participation of private financiers who want to invest in a given expanding ICT company.

The Twinning programme in The Netherlands has demonstrated a flying start. It has certainly become a very successful model for ICT starters. Of course, the real question is whether the ICT developments of companies operating under the Twinning Scheme have a better performance than others (e.g., in terms of death rates of firms). The first results are indeed very positive and one may conclude that the

Twinning programme has reached its goals. Clearly, the success rate is also due to the strict screening process of selected firms. Also the monitoring of the performance of firms participating in the Twinning scheme turns out to be effective. To this end, even four regional Twinning centres have been established (Amsterdam, Delft/Rotterdam, Eindhoven and Enschede). Apparently, also the geographic foothold of the Twinning initiatives plays a role of importance.

Despite its success, there are also some flaws in the Twinning programme. Intensive coaching on a non-bureaucratic basis is time-consuming and does not also meet the needs of starters. In general, start-up companies tend to avoid paper work and administrative and financial procedures, so that a uniform system has not emerged. In addition, starters wish to be their own boss and not to be checked by Twinning advisors, so that sometimes a conflict of competence has emerged. Finally, the Twinning venture capital scheme does not offer clear possibilities for corporate venture capital provision.

It is noteworthy that the high degree of success of the Twinning programme has prompted counter-arguments against this initiative. If a government-instigated model is too commercially successful on the market, there is no need anymore for a public intervention and support. Apparently, the private market can easily take over this initiative. This type of public private partnership with venture capital provided by the public sector is no longer necessary and private investors can come in now. Risks become acceptable as a result of the rapid capital gains in the ICT sector. Indeed, in recent years we witness an increasing market entry of private financiers who are willing to provide start-up firms with venture capital. Besides, they are more flexible, as they do not only orient themselves towards the ICT sector, but to any new innovative activity (e.g., bio-technology, logistics).

In conclusion, the Dutch Twinning programme has played a critical role as incubator in the market for venture capital for ICT start-up companies and has generated a clear market dynamics and new entrepreneurial style in the ICT field. It has led to an accelerated growth pace of new starters. The Dutch government has in the mean time decided to take the Twinning initiative out of the public sector in due course, so that it may proceed as an independent privately-oriented venture capital agency. To this end the government would have to sell its shares (created out of capital gains) in the various Twinning firms. This will certainly take a few more years; with the decline (or even collapse) of the new economy and the less favourable

global economic prospects a completion of the Twinning programme in the short run has become less easy. And finally, regarding the direct access of start-up firms to the geographically deconcentrated Twinning centres, it ought to be mentioned that the same type of spatially dispersed management and advisory facilities can be offered by the private sector.

#### **4. Venture Capital Initiatives in Israel**

In recent years Israel has created various innovative seed and start-up capital sources for high-tech firms. Two well-known successful incubator initiatives are Yozma and the Technological Incubators programme, which led to the birth and development of numerous innovative high-tech oriented firms in Israel ('the Shalom Valley'). The ICT sector, in particular, has become in the past decade a booming sector, mainly as a result of the high-skilled (mainly Russian) immigrants, the strong defence sector, the regulatory reform (deregulation) in the telecommunications field, and the establishment of incubator programmes. Part of this programme is offering venture capital facilities, but the main mission is to offer a local breeding ground for high-tech initiatives. Israel has at present a great variety of technological incubators all over the country, involving many strategic and commercial partners as well as capital investors. These incubators offer various entrepreneurial support mechanisms, such as business premises, project tools, professional guidance, administrative assistance and financial resources. Hence, the public sector provides a sheltered business environment for start-up companies. Clearly, the current political and military instability in the Middle-East is not favourable to a further rapid growth in the ICT sector, as this will discourage foreign investors to create a critical mass in Israel.

The telecommunication sector in Israel is nowadays in a stage of transition moving towards full liberalisation. Many new carriers have in recent years entered the telecom market and this has had significant implications for the industrial organisation of the market and for the range and quality of consumer services. Also a wide range of complementary business services is offered at present, making the telecommunications sector a booming market. Entry of foreign telecom firms and vertical integration on the domestic market open up many market opportunities for small firms. The big companies cannot afford to develop specialty services for niche customers or to offer niche products. Thus, there is much scope for start-up firms,

provided they are funded by eager venture capitalists. Besides, these new firms are often creating many innovative services or goals, which may be of great interest to large corporations. These innovative ideas offer opportunities for corporate venture capital, as such a financing system has a short time-to-market, a focussed but flexible market orientation, and a permanent drive to innovate. The question now is whether the use of corporate venture capital schemes in the ICT sector in Israel has met the high expectations.

Based on extensive fieldwork and in depth interviews among a set of seven leading organisations as to their CVC programme in Israel, an attempt has been made to identify the critical success factors for effective and efficient corporate venture capital schemes (see for details Guldmond 2001). Various parameters of the schemes were investigated in greater detail. The most important parameters analysed were:

- ❑ the variety in *goals* of the corporate venture capital programme, ranging from purely financial to broader strategic goals
- ❑ the specific *industrial focus*, ranging from a clear telecom orientation to a much wider perspective
- ❑ the *geographic focus*, ranging from the home market to the global market
- ❑ the *organisational structure*, ranging from a dependent to an independent position with respect to the parent company
- ❑ the *stage of investment selection*, ranging from early stage to mature stage investments
- ❑ the type of *risk capital programme structure*, ranging from absence to presence of venture capitalists
- ❑ the *degree of syndication*, ranging from absence to full presence of syndication in risk capital provision.

Clearly, the sample is not extensive, but covers the most important incubator firms engaged as corporate venture capital organisations in the ICT field. The results of the field work deploying the above described critical parameters are summarised in Table 1 for each of the seven corporate venture capital organisations under consideration. Based on in depth interviews, the entries in this table indicate which success parameters are to be considered as critical performance conditions for the firms concerned.

|   | Corporate venture capital organisations |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|
| Critical success parameters   | 1                                       | 2 | 3 | 4 | 5 | 6 | 7 |
| Focus on financial criteria with strategic goals next                   | -                                       | - |   |   | - | - | + |
| focus on broad-based telecom activities without too much specialisation | +                                       | ? |   | + | - | - | + |
| focus on ICT investments in Shalom Valley                               | +                                       | + | + | + | + | + | + |
| need for independent position with respect to parent company            | -                                       | ? |   |   | - | + | - |
| Investments in early stage companies                                    | +                                       | - | + | - | - | + | + |
| close co-operation with a venture capitalist                            | +                                       | + | ? | + | + | + | ? |
| caution in engaging in syndication                                      | +                                       | ? | + | + | + | + | ? |

**Table 1. A review of findings on critical parameters of Israeli ICT corporate venture capital firms**

**Legend:** + parameter is confirmed  
 • parameter is rejected  
 ? no or ambiguous response

Table 1 leads to the following conclusions. Corporate venture capital tends to have a strategic orientation addressing also many non-financial interests. There is an ambiguity in the pure telecom profile, but there is a clear conviction that all such investments should find their home base in Shalom Valley. The need for a relatively autonomous position with respect to the parent company is not very evident, nor is there a clear interest in early stage ICT investments. A close co-operation with a venture capitalist is supported by most interviewees, while there is some clear hesitation to engage in venture capital syndication.

## 5. Policy Lessons

Access to risk capital is a sine qua non for successful business life and ought to be facilitated in order to gain the benefit of innovation in a competitive environment. On the basis of the above observations on different venture capital initiatives in two different countries, we may draw the following lessons for innovation policy.

In the first place, the government may play an active role as a facilitator of innovative activities, but has to withdraw as soon as the private market is able to take over in an efficient and transparent way. Governments might also improve the relationships between venture firms and corporations.

Gains for the government as a result of participation in venture capital initiatives cannot always be immediately cashed in as a result of changing market conditions. So a government needs much flexibility in order to manage the risk from bail-out.

Despite the ubiquitous nature of information in our ICT age, business firms still tend to have a regional orientation in establishing their firm or in seeking consultancy services. Consequently, also other sectors (such as biomedics and life sciences) might be considered for venture capital provision. Clearly, a strategic long-term perspective on the role of venture capital in regional development' is needed.

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